

PAPERS AND SHORT REPORTS

Reducing errors in the accident department: a simple method using radiographers

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Abstract

The assessments by radiographers of 1628 consecutive patients referred for radiography in the casualty department were analysed. The radiographers missed abnormalities in the radiographs in 68 of the cases. Casualty officers missed abnormalities in 63 cases, but only 35 patients were common to both groups. Twenty eight of the radiographs interpreted wrongly by casualty officers were interpreted correctly by radiographers; 16 of these 28 were thought by the accident and emergency consultant to be clinically important.

It is suggested that a system whereby radiographers signal abnormalities should be standard practice.

Introduction

An increasing workload has resulted in some casualty departments abandoning the reporting of radiographs. Errors by casualty officers in detecting clinically important abnormalities in x ray films has been reported to be as high as 2% of all examinations.¹ A survey showed that 26% of medical litigation concerns accident and emergency orthopaedic cases.²

A scheme was introduced at Ealing Hospital in 1981 and subsequently at Northwick Park Hospital whereby radiographers

marked casualty radiographs that they considered to show abnormalities. We present a prospective evaluation of this scheme.

Methods

From August 1982 radiographers marked the envelopes of all casualty radiographs thought to show abnormalities. In December 1983 this scheme was suspended. Over seven weeks starting in January 1984 the radiographers completed a form for each of 1628 consecutive patients examined by radiography in the casualty department. Although student radiographers were excluded, qualified radiographers of all grades participated in the study. The junior casualty officers were not informed of this assessment. Within 24 hours two consultant radiologists examined the films, the casualty officers' notes, and the radiographers' assessment.

False negative interpretations (by casualty officers and radiographers) were classified by the accident and emergency consultant as clinically important or unimportant, taking into account whether a correct diagnosis would have altered treatment or advice given to the patient and any medicolegal consequences that might have arisen had the abnormality remained undetected.

Results

The tables show the results. Ninety three of the radiographers' forms were incomplete, and a further 39 were marked "too busy to complete." These forms were scrutinised to ensure that they were not incomplete because of the radiographer's reluctance to report on a particular examination—for example, radiography of the skull or chest.

Of 1496 films subsequently evaluated, 1278 (85%) were of patients referred because of trauma. Radiographers missed abnormalities in 68 patients (4.5% of all patients) and the casualty officers in 63 (4.2%) (table I). Although this suggested a similar ability to detect abnormalities, only 35 patients were common to both groups. Twenty eight of the radiographs wrongly interpreted by casualty officers were correctly interpreted by the radiographers (table II). Sixteen of these 28 abnormalities were considered to be clinically or medicolegally important—namely, fractures of the metacarpals or metatarsals (four patients), scaphoid (one), Colles (two), supracondylar humerus (one), neck of humerus (one), clavicle (one), sacrum (one), and fibula (two); air fluid level in antrum (one); perforated viscus (one); and collapse of the lower lobe (one).

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Discussion

About half of the clinically important abnormalities wrongly interpreted by casualty officers were correctly interpreted by the radiographers at examination. Although we do not underestimate the hazards of overtreatment, we did not analyse the false positive interpretations made by the casualty officers or radiographers. In general, minor mistakes were responsible for these, such as attributing a fracture to an accessory ossicle that was often some distance from the site of the injury. We think that casualty officers are unlikely to treat patients on the basis of a radiographer's suspicion unless there is clear focal clinical evidence.

Swinburne proposed training radiographers in the recognition

TABLE 1—Interpretations of radiographs by radiographer and casualty officer

Interpretation of radiograph	Radiographer	Casualty officer
Correct	1307	1331
Incorrect:		
False positive	37	38
False negative	68	63
Uncertain	84	64
Total	1496	1496

TABLE 2—Casualty consultants' assessment of clinical importance of abnormalities detected in radiographs

	False negative interpretations made by:		
	Radiographers	Casualty officers	Casualty officers but not radiographers
Important	43	34	16
Not important	25	29	12
Total	68	63	28

of patterns.³ This has been introduced in obstetric and to a lesser extent non-obstetric ultrasonography. Aberdour suggested delegating certain categories of reporting and considered that "radiographers may prove able to report on some or all casualty patients."⁴ Galasko and Monahan reported the value of double reading casualty radiographs, with a third reading uncovering an appreciable number of further abnormalities.⁵ Not surprisingly, individual radiographers' performances correlated reasonably well with seniority, and this may increase the efficacy of this scheme in district hospitals with relatively more senior radiographers. Defence organisations have informed us that as long as casualty officers were aware that the radiographer's report was not legally binding they would not object to the radiographer's opinion being volunteered.

This scheme does not require any expense or paperwork. We emphasise that although marking radiographs is regarded as informal, only when it is introduced as a regular procedure will it reduce errors considerably and be regarded as clinically helpful by casualty officers, who need only to look at the packet to see the marking.

We acknowledge the help of Mr Neil Cheyne and Mr Quentin Bowyer, of Ealing Hospital, who originated this scheme, and of Dr David Hill, of the computing department, Clinical Research Centre, Harrow.

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(Accepted 7 November 1984)

Are low cholesterol values associated with excess mortality?

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Abstract

The relation between cholesterol concentration and mortality was studied prospectively over 17 years in 630 New Zealand Maoris aged 25-74. The dead or alive state of each person was determined in 1981. The causes of death were divided into three categories: cancer, cardiovascular disease, and "other." Using univariate and both linear and non-linear multivariate methods of analysis for survivorship data, significant inverse relations with serum cholesterol were found for total

mortality in women, for mortality from cancer in men and women, and for other causes of mortality in both men and women. The inverse and non-linear association with total mortality in women remained significant when deaths in the first five years of follow up were excluded. This suggests that the association was not explained by undetected illness causing low cholesterol concentrations at the time of initial examination.

Introduction

A review in 1981 of 17 epidemiological studies found in eight an inverse relation between blood cholesterol values and total cancer mortality, particularly in older men, while in the remaining nine studies there was no relation in men or women.¹ Three additional studies found that the inverse association gradually disappeared as the duration of follow up increased, suggesting that the lower cholesterol concentrations in people subsequently dying of cancer were due to the effect of undetected disease.²⁻⁴ This explanation, however, has not been supported by other studies.^{5,6}

A study of New Zealand Maoris followed up for 11 years

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